

DIRECT TESTIMONY OF
ERIC H. BELL, P.E.
ON BEHALF OF
DOMINION ENERGY SOUTH CAROLINA, INC.
DOCKET NO. 2021-2-E

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **OCCUPATION.**

3 A. My name is Eric H. Bell. My business address is 220 Operation Way, Cayce,
4 South Carolina. My position is Manager - Electric Market Operations for Dominion
5 Energy South Carolina, Inc. (“DESC” or the “Company”).
6

7 **Q. STATE BRIEFLY YOUR EDUCATION, BACKGROUND, AND**
8 **EXPERIENCE.**

9 A. I am a graduate of the University of Texas at Austin with a Bachelor of
10 Science degree in Electrical Engineering and am licensed in South Carolina as a
11 Professional Engineer. Following graduation, I served in the United States Navy as
12 a Nuclear Submarine Officer. In 1994, I began my career with South Carolina
13 Electric & Gas Company (“SCE&G”) as Assistant Plant Engineer and, in 1997, was
14 promoted to Operations Planner. From 2001 to 2008, I engaged in economic
15 resource commitment efforts and, in 2008, I assumed my current role as Manager –
16 Electric Market Operations. In this position I manage a group of Economic

1 Resource Commitment Planners and am responsible for managing and optimizing
2 generation fleet dispatch and unit commitment to provide reliable, low-cost energy
3 to DESC customers. Among other things, my responsibilities include participating
4 in fuel purchasing decisions, unit commitment, and the coordination of activities
5 and system data with power marketing, transmission system control, maintenance
6 scheduling, and natural gas supply. Since June of 2019, I have also been responsible
7 for DESC's generation planning, which includes managing the development of the
8 Integrated Resource Plan ("IRP") and avoided cost studies.

9
10 **Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT WITNESS**
11 **BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA**
12 **(THE "COMMISSION")?**

13 A. Yes, I have testified before in a prior proceeding.

14
15 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

16 The purpose of my testimony is to discuss the 11 components of value for
17 distributed energy resource ("DER") avoided cost contained in the net energy
18 metering ("NEM") methodology approved by the Commission in Order No. 2015-
19 194, issued in Docket No. 2014-246-E. At the end of my testimony, I also discuss
20 a change in the fuel price used to dispatch coal-fired generation units that was
21 implemented on January 1st of this year.

NEM BACKGROUND

Q. WHAT ARE DISTRIBUTED ENERGY RESOURCES?

A. South Carolina Code Section 58-39-120(C) defines DER as follows:

[D]emand- and supply-side resources that can be deployed throughout the system of an electrical utility to meet the energy and reliability needs of the customers served by that system, including, but not limited to, renewable energy facilities, managed loads (including electric vehicle charging), energy storage, and other measures necessary to incorporate renewable generation resources, including load management and ancillary services, such as reserves, voltage control, and reactive power, and black start capabilities.

Q. WHAT IS NET ENERGY METERING?

A. South Carolina Code Section 58-40-10(E) defines NEM as follows:

“Net energy metering” means using metering equipment sufficient to measure the difference between the electrical energy supplied to a customer-generator by an electrical utility and the electrical energy supplied by the customer-generator to the electricity provider over the applicable billing period.

1 **Q. HOW IS NEM EMPLOYED ON THE COMPANY’S ELECTRIC SYSTEM?**

2 A. For customers using solar or other DER on the system, NEM measures
3 generation on both sides of the meter, i.e., it measures both the electricity provided
4 by the Company to the customer as well as the electricity provided by the customer
5 to the Company if the customer’s DER generates more electricity than the customer
6 uses. All NEM customers currently on the DESC system have installed photovoltaic
7 (“PV”) solar generation.

8
9 **Q. WHAT ARE AVOIDED COSTS?**

10 A. As Company Witness Furtick notes in his testimony, South Carolina Code
11 Section 58-39-120(B) defines “avoided costs” as “payments for purchases of
12 electricity made according to an electrical utility’s most recently approved or
13 established avoided cost rates in this State or rates negotiated pursuant to [the
14 Public Utility Regulatory Policies Act (“PURPA”)], in the year the costs are
15 incurred, for purchases of electricity from qualifying facilities pursuant to Section
16 210 of [PURPA]....”

17 PURPA and its implementing regulations require electric utilities, including
18 DESC, to purchase electric energy from qualifying facilities (“QF”) at the utilities’
19 avoided costs. However, state public utility commissions, such as the Commission,
20 determine the method for calculating avoided costs, which are updated on a periodic
21 basis. PURPA and the related regulations define “avoided costs” as “the

1 incremental costs to an electric utility of electric energy or capacity or both which,
2 but for the purchase from the qualifying facility or qualifying facilities, such utility
3 would generate itself or purchase from another source.” 18 C.F.R. § 292.101(b)(6).
4 The Federal Energy Regulatory Commission (“FERC”) further recognizes that
5 avoided costs include two components: “energy” and “capacity.” Specifically,
6 “[e]nergy costs are the variable costs associated with the production of electric
7 energy (kilowatt-hours). They represent the cost of fuel, and some operating and
8 maintenance expenses. Capacity costs are the costs associated with providing the
9 capability to deliver energy; they consist primarily of the capital costs of facilities.”
10 *Small Power Production and Cogeneration Facilities; Regulations Implementing*
11 *Section 210 of the Public Utility Regulatory Policies Act of 1978*, Order No. 69, 45
12 Fed. Reg. 12,214, 12,216 (Feb. 25, 1980); *see also Qualifying Facility Rates and*
13 *Requirements Implementation Issues Under the Public Utility Regulatory Policies*
14 *Act of 1978*, Order No. 872-A, 173 FERC ¶ 61158 (Nov. 19, 2020) (“The [FERC]
15 has not changed these definitions; they still apply to both ‘short-run’ (energy or non-
16 firm power) and long-run (capacity or firm power) avoided costs.”).
17

18 **Q. WHAT APPROACH DOES DESC TAKE TO CALCULATE THE ENERGY**
19 **AND CAPACITY COMPONENTS OF AVOIDED COSTS?**

20 A. As approved by the Commission in Orders No. 2016-297, 2018-322(A), and
21 2019-847, DESC uses a Difference in Revenue Requirements methodology to

1 calculate both the energy component and the capacity component of its avoided
2 costs. This approach follows directly from PURPA's definition of avoided costs in
3 that it involves calculating the revenue requirements between a base case and a
4 change case. The base case is defined by DESC's existing and future fleet of
5 generators and the hourly load profile to be served by these generators, as well as
6 the solar facilities with which DESC has executed a power purchase agreement. The
7 change case is the same as the base case except that, pursuant to Order No. 2020-
8 244, a zero-cost purchase transaction is modeled at 100MW around the clock. This
9 is the same technology neutral avoided energy cost calculation used for the PR –
10 Standard Offer as presented by South Carolina Solar Business Alliance ("SBA")
11 Witness Burgess in Docket 2019-184-E and endorsed by the Commission in that
12 proceeding.¹ For the avoided energy cost determination, a system production cost
13 model called PROSYM, which models the least-cost commitment and dispatch of
14 generating units to serve load hour-by-hour, makes two runs and estimates the
15 production costs and benefits that result from the purchase transaction. The base
16 and change cases are identical except for the zero-cost purchase transaction. The
17 avoided energy cost is the difference between the base case costs and the change
18 case costs.

¹ The Company is using SBA Witness Burgess's energy cost calculation for purposes of this proceeding, but understands that this calculation significantly overstates the value of solar generation.

COMPONENTS OF VALUE FOR
NET ENERGY METERING DISTRIBUTED ENERGY RESOURCES

Q. WHAT ARE THE COMPONENTS OF VALUE FOR NEM DISTRIBUTED ENERGY RESOURCES?

A. In Order No. 2015-194, the Commission approved the following 11 components of value for NEM Distributed Energy Resources:

Net Energy Metering Methodology

1. +/- Avoided Energy
2. +/- Energy Losses/Line Losses
3. +/- Avoided Capacity
4. +/- Ancillary Services
5. +/- T&D Capacity
6. +/- Avoided Criteria Pollutants
7. +/- Avoided CO₂ Emission Cost
8. +/- Fuel Hedge
9. +/- Utility Integration & Interconnection Costs
10. +/- Utility Administration Costs
11. +/- Environmental Costs

= Total Value of NEM Distributed Energy Resources

As directed by the Commission in Order No. 2020-244 issued in Docket No. 2019-184-E, the Company submitted the current components of value of NEM Distributed Energy Resources to the Commission by letter dated March 26, 2020.² Table 1, below, shows these current components of value.

² For clarity, I note that in the Table of Total Value of NEM Distributed Energy Resources that was submitted to the Commission in the March 26, 2020, the header of the second column reads "IRP Planning Horizon (15-Year Levelized)." However, this column should have been captioned "10-Year Levelized" because the Commission approved the use of a 10-year period for NEM Distributed Energy Resources in Order No. 2019-847 and that was the basis on which the numbers in that column in the March 26, 2020 letter were calculated.

Table 1
Total Value of NEM Distributed Energy Resources (\$/kWh)
Currently in Effect

	Current Period (\$/kWh)	10-Year Levelized (\$/kWh)	Components
1	\$0.02784	\$0.02865	Avoided Energy Costs
2	\$0	\$0.00379	Avoided Capacity Costs
3	\$0	\$0	Ancillary Services
4	\$0	\$0	T & D Capacity
5	\$0.0000300	\$0.0000300	Avoided Criteria Pollutants
6	\$0	\$0	Avoided CO ₂ Emission Cost
7	\$0	\$0	Fuel Hedge
8	(\$0.00096)	(\$0.00096)	Utility Integration & Interconnection Costs
9	\$0	\$0	Utility Administration Costs
10	\$0.00890	\$0.00105	Environmental Costs
11	\$0.02780	\$0.03256	Subtotal
12	\$0.00227	\$0.00266	Line Losses @ 0.9245
13	\$0.03007	\$0.03522	Total Value of NEM Distributed Energy Resources

Q. HAS DESC UPDATED THESE COMPONENTS OF VALUE?

A. Yes. Table 2 shows the updated components of value for NEM Distributed Energy Resources. Two columns of numbers are shown: one for the current value and one for the value over the ten-year planning period. The difference between these two columns of numbers represents the future benefits of DER that are subject to recovery by the Company pursuant to Commission Order No. 2015-194 and South Carolina Code Section 58-40-20.

Table 2
Total Value of NEM Distributed Energy Resources (\$/kWh)
Proposed Values

	Current Period (\$/kWh)	10-Year Levelized (\$/kWh)	Components
1	\$0.02760	\$0.03085	Avoided Energy Costs
2	\$0	\$0.00379	Avoided Capacity Costs
3	\$0	\$0	Ancillary Services
4	\$0	\$0	T & D Capacity
5	\$0.0000011	\$0.0000010	Avoided Criteria Pollutants
6	\$0	\$0	Avoided CO ₂ Emission Cost
7	\$0	\$0	Fuel Hedge
8	(\$0.00096)	(\$0.00096)	Utility Integration & Interconnection Costs
9	\$0	\$0	Utility Administration Costs
10	\$0.00127	\$0.00121	Environmental Costs
11	\$0.02791	\$0.03489	Subtotal
12	\$0.00228	\$0.00285	Line Losses @ 0.9245
13	\$0.03019	\$0.03774	Total Value of NEM Distributed Energy Resources

Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR AVOIDED ENERGY COSTS SHOWN ON LINE NO. 1 OF TABLE 2.

A. The component of value for avoided energy costs are based on the PURPA avoided cost values previously discussed with one adjustment. The avoided energy costs are adjusted to remove the cost of criteria pollutants and environmental costs, which are then reflected in the components shown on Lines 5 and 10, i.e., Avoided Criteria Pollutants and Environmental Costs. The avoided energy costs value is based on the energy profile of a solar QF.

1 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR AVOIDED**
2 **CAPACITY COSTS SHOWN ON LINE NO. 2 OF TABLE 2.**

3 A Pursuant to Commission Order No. 2020-244, the component of value for
4 avoided capacity is set to \$3.79/MWH. The Commission adopted the
5 recommendation of ORS Witness Horii in Docket No. 2019-184-E for the capacity
6 value of solar. This calculation is based on the ELCC method as interpreted by
7 Witness Horii and applied to an annualized avoided capacity value of
8 \$66,757.50/kW. This value is applied to a solar QF energy profile and results in the
9 value shown on Line No. 2 of Table 2.

10
11 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR ANCILLARY**
12 **SERVICES SHOWN ON LINE NO. 3 OF TABLE 2.**

13 A. Ancillary services refer to the need to balance the load and generation on the
14 system and include operating reserves, both spinning and non-spinning; frequency
15 regulation; and voltage control. DESC expects that the cost of providing these
16 ancillary services will increase with the addition of large amounts of solar energy.
17 DESC has assigned a value of zero to ancillary services but will address non-zero
18 costs under the overlapping concept of integration cost on Line No. 8 of Table 2.

1 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR TRANSMISSION**
2 **AND DISTRIBUTION CAPACITY SHOWN ON LINE NO. 4 OF TABLE 5.**

3 A. DESC's NEM distributed resources do not avoid transmission or distribution
4 capacity and therefore the value of this component is zero. The transmission and
5 distribution peak load occur on cold winter mornings most often before sunrise and
6 always before significant production from PV solar systems. Even if some
7 contribution were assumed in the peak demand period, it could not be counted for
8 planning or contingencies due to the intermittent nature of the resource. Therefore,
9 when evaluating the need for improvements on those power delivery systems, no
10 contribution can be assumed from PV solar generation and no credit is given in the
11 model when planning for a contingency.

12 On the distribution system, DESC's engineers must design a circuit for
13 circumstances that will stress the circuit. In particular, since solar output is
14 intermittent during the day and non-existent at night, engineers must also plan for
15 when the DER are not supplying power. The distribution line must carry the load
16 both when the DER are generating and when they are not because of weather-related
17 factors or because the DER are offline. As such, the DER do not provide any benefit
18 in the analysis and are not assigned value.

1 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR AVOIDED**
2 **CRITERIA POLLUTANTS SHOWN ON LINE NO. 5 OF TABLE 2.**

3 A. DESC associates a positive avoided cost value to criteria pollutants NO_x and
4 SO₂. The avoided cost of these pollutants typically is included in the Company's
5 avoided energy costs but these costs have been separated out in this proceeding for
6 reporting purposes.

7
8 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR AVOIDED CO₂**
9 **POLLUTANTS SHOWN ON LINE NO. 6 OF TABLE 2.**

10 A. Pursuant to Commission Order No. 2015-194, the component of value for
11 avoided CO₂ is set at zero until state or federal laws or regulations result in an
12 avoidable cost on utility systems for these emissions. Currently, there are no state
13 or federal laws or regulations restricting the emission of CO₂ pollutants and,
14 therefore, the value for CO₂ pollutants is zero.

15
16 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR FUEL HEDGE**
17 **SHOWN ON LINE NO. 7 OF TABLE 2.**

18 A. DESC does not hedge fuels for electric generation. Therefore, the value for
19 fuel hedging is zero.

1 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR UTILITY**
2 **INTEGRATION & INTERCONNECTION COSTS SHOWN ON LINE NO. 8**
3 **OF TABLE 2.**

4 A. Pursuant to Commission Order No. 2020-244, issued in Docket No. 2019-
5 184-E, the component of value for the integration charge is set to \$0.96/MWH. The
6 Commission adopted the recommendation of SBA Witness Burgess in Order No.
7 2020-244 to set an interim variable integration charge for solar generation. This
8 interim integration charge will be deducted from the avoided cost credit until the
9 Commission orders a final integration charge. All rates based on this interim
10 integration charge are subject to a “true-up” as provided in Order No. 2020-244.

11
12 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR UTILITY**
13 **ADMINISTRATION COSTS SHOWN ON LINE NO. 9 OF TABLE 2.**

14 A. At present, the administration costs of NEM Distributed Energy Resources
15 are being collected through a DER rider being added to the fuel clause. Therefore,
16 the value of this component for purposes of the NEM Distributed Energy Resources
17 methodology calculation is zero.

1 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR**
2 **ENVIRONMENTAL COSTS SHOWN ON LINE NO. 10 OF TABLE 2.**

3 A. The component of “Environmental Costs” refers to any appropriate
4 environmentally related costs that were not already included in other net metering
5 methodology components. DESC associates a positive avoided cost value to
6 represent the cost of certain environmental materials used in the generation of
7 energy, such as lime, limestone, and ammonia. The avoided cost of these materials
8 typically is included in the Company’s avoided energy costs, but these costs have
9 been separated out in this proceeding for reporting purposes.

10
11 **Q. PLEASE EXPLAIN THE COMPONENT OF VALUE FOR ENERGY**
12 **LOSSES/LINE LOSSES SHOWN ON LINE NO. 11 OF TABLE 2.**

13 A. When a NEM Distributed Energy Resource serves a customer’s load behind
14 their meter or when it puts power onto the distribution system, DESC avoids having
15 to generate that specific amount of energy. The Company also avoids the energy
16 required to bring the power to the customer’s meter or the distribution system, i.e.,
17 the line losses associated with delivering power across the system. The loss factor
18 used for these NEM values represents the cumulative marginal line losses at a
19 residential customer’s meter.

1 **Q. HAS THE GENERAL ASSEMBLY ENACTED LEGISLATION THAT**
2 **WILL PHASE OUT THE NEM PROGRAM?**

3 A. Yes. In South Carolina Code Section 58-40-20(B), the General Assembly
4 requires electric utilities to make NEM available to customer-generators who apply
5 before June 1, 2021, and allows the customer-generators to continue NEM “as
6 provided for in Commission Order No. 2015-194 until May 31, 2029.”
7

8 **Q. WHAT PROGRAM HAS THE GENERAL ASSEMBLY PROVIDED FOR**
9 **CUSTOMER-GENERATORS WHO APPLY AFTER MAY 31, 2021?**

10 A. In Section 58-40-20(F), the General Assembly required development of a
11 “solar choice metering tariff” for customer-generators who apply after May 31,
12 2021. DESC’s solar choice metering tariff is the subject in Docket No. 2020-229-E.
13

14 **Q. EVEN THOUGH THE GENERAL ASSEMBLY HAS ENACTED**
15 **LEGISLATION PROVIDING FOR TERMINATION OF THE NEM**
16 **PROGRAM AND ESTABLISHMENT OF THE SOLAR CHOICE**
17 **PROGRAM, IS IT NECESSARY TO CONSIDER THE COSTS OF THE**
18 **NEM PROGRAM IN THIS PROCEEDING?**

19 A. Yes. Because the Company’s current NEM program will continue until May
20 31, 2029, for customer-generators applying on or before May 31, 2021, it is

1 necessary to consider the costs of the NEM program as part of the Company's fuel
2 cost proceedings during the pendency of that program.

3
4 **MODIFICATION OF METHOD TO DETERMINE COAL PRICE**
5 **DISPATCH SIGNAL**

6 **Q. WHAT IS THE PURPOSE OF THE COAL PRICE DISPATCH SIGNAL?**

7 A. The purpose of the coal price dispatch signal is to provide for a price point
8 in dollars per MWH that will be utilized to dispatch coal-fired generating units in
9 economic order as compared to price points used for other units such as those fueled
10 by natural gas.

11
12 **Q. WHAT METHODOLOGY HAS DESC HISTORICALLY EMPLOYED TO**
13 **DETERMINE THE COAL PRICE DISPATCH SIGNAL?**

14 A. The Company historically has dispatched coal units using a fuel price signal,
15 the weighted average cost of projected coal receipts, that is updated monthly. This
16 fuel price signal is set in a memorandum issued monthly by DESC's fuel
17 procurement department that summarizes the anticipated coal train receipts for the
18 month and the average total delivered cost (cost of coal plus transportation costs) of
19 those anticipated receipts by generation facility.

1 **Q. WHAT IS THE NEW METHODOLOGY THAT DESC IS EMPLOYING TO**
2 **DETERMINE THE COAL PRICE DISPATCH SIGNAL?**

3 A. DESC will be using the replacement cost for coal as the dispatch signal.
4 Replacement cost is the cost to replace the coal at the time it is consumed.
5

6 **Q. WHY IS DESC CHANGING THE METHODOLOGY OF DETERMINING**
7 **THE COAL PRICE DISPATCH SIGNAL?**

8 A. Using replacement cost provides a dispatch signal that is more responsive to
9 market changes than the prior methodology employed by DESC. The appropriate
10 replacement cost can be obtained from market indices that are published on a daily
11 or weekly basis, whereas the prior methodology used a signal computed only once
12 a month.

13 Using replacement cost also better reflects and incorporates into pricing the
14 interrelated coal and natural gas markets, because natural gas units are also
15 dispatched based off the daily commodity spot price. The Company believes that,
16 going forward, using significantly different fuel price signals for dispatching coal
17 and natural gas units with much different timing would be less effective and
18 efficient. Continuing to use anticipated receipts as a signal would lag the markets
19 and could diminish the impact of economy spot purchases.

20 The industry standard for a coal dispatch price signal is replacement cost.
21 Duke Energy Carolinas, Duke Energy Progress, and the South Carolina Public

1 Service Authority all use replacement cost as the coal price dispatch signal. The
2 change will further intra-company consistency since Dominion Energy Virginia
3 uses replacement cost as its coal price dispatch signal.
4

5 **Q. WILL THIS CHANGE IN METHODOLOGY IMPACT THE**
6 **ACCOUNTING PROCESS CURRENTLY USED FOR COAL?**

7 A. No. The Company will continue expensing coal at the actual purchase cost
8 as the coal is removed (consumed) from inventory.
9

10 **Q. WHEN DID THE COMPANY IMPLEMENT THE CHANGE IN**
11 **METHODOLOGY?**

12 A. The change was implemented on January 1, 2021. This date for the change
13 was selected because it was the beginning of a new fuel cost review period for the
14 Company and because the Company also changed to a new fuel inventory
15 management software, COMTRAC, on that same date.
16

17 **Q. DID THE COMPANY MEET WITH THE OFFICE OF REGULATORY**
18 **STAFF (“ORS”) BEFORE IMPLEMENTING THE CHANGE IN**
19 **METHODOLOGY?**

20 A. Yes. Company personnel met with ORS representatives on November 19,
21 2020, to discuss the then-proposed modification to the methodology for determining

1 the coal price dispatch signal. ORS representatives raised no objection to the
2 change.

3 **CONCLUSION**

4 **Q. WHAT IS DESC ASKING THE COMMISSION TO DO IN THIS**
5 **PROCEEDING?**

6 A. DESC respectfully requests that the Commission approve the calculation of
7 the total value of NEM Distributed Energy Resources as set forth in my testimony.

8
9 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

10 A. Yes.